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Concerning This Issue . . .

This issue of the *Bulletin* is primarily devoted to two very different, but equally interesting, plant growing places — Madagscar and the Washington Park Arboretum. If you are tired of this rather dreary spring weather, take an armchair voyage to sunny Madagascar with Joy Spurr. The island abounds with interesting flora and fauna which have been beautifully captured by Joy in photos and words. In our own part of the world Daniel Hinkley takes us on a tour of some of the choicest maples in the Arboretum. These beautiful trees are just now unfolding their leaves. Leaves and flowers are springing to life in Gretchen Gould's garden as well and in her article she reflects upon the wonder of springtime.

This spring has been a busy time for the Arboretum. I hope everyone has had an opportunity to enjoy some of the special events — the dedication of the new Visitor Center, Arboretum Week, the photo contest and the plant sale. So plan a trip to the Arboretum and enjoy.

Nancy Pascoe
Editor

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Arboretum Bulletin

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THE COVER

Acer circinatum, from *Silva of North America, Vol. 1*
by Charles Sprague Sargent, illustrated by Charles Edward Faxon,
engraved by Philbert & Eugent Picart. Courtesy of the
Rare Book Room, Miller Library

Reflections Upon My Garden at Springtime

GRETCHEN N. GOULD

Gretchen Gould is a long-time Arboretum Foundation member. For many years she was a childrens guide on the native plant trail.

Spring, more than any other season, is a time of magic and miracles and, especially, a time of wonder. Truly this is the season to merge with nature. If one stands outdoors on an early morning when it is still and calm one gradually becomes aware of sounds, sweet fragrances and the almost visible growth of plants.

In my own garden a rainshower passes and leaves behind a clarity and brilliance — everything sparkles and shimmers. Silver droplets of rainwater sit on the soft furry leaves of the lady's mantle and in the cups of the unfolding *Hosta* leaves. Nearby, a single yellow poppy against a background of rainy-wet green is startling in its vividness. The dazzling brilliance of spring's sunlight touches upon the yellow dandelions, daffodils, *Doronicum* daisies and primroses. It is easy to daydream when amongst the flowers and fragrances. Have you ever noticed how a scent can take

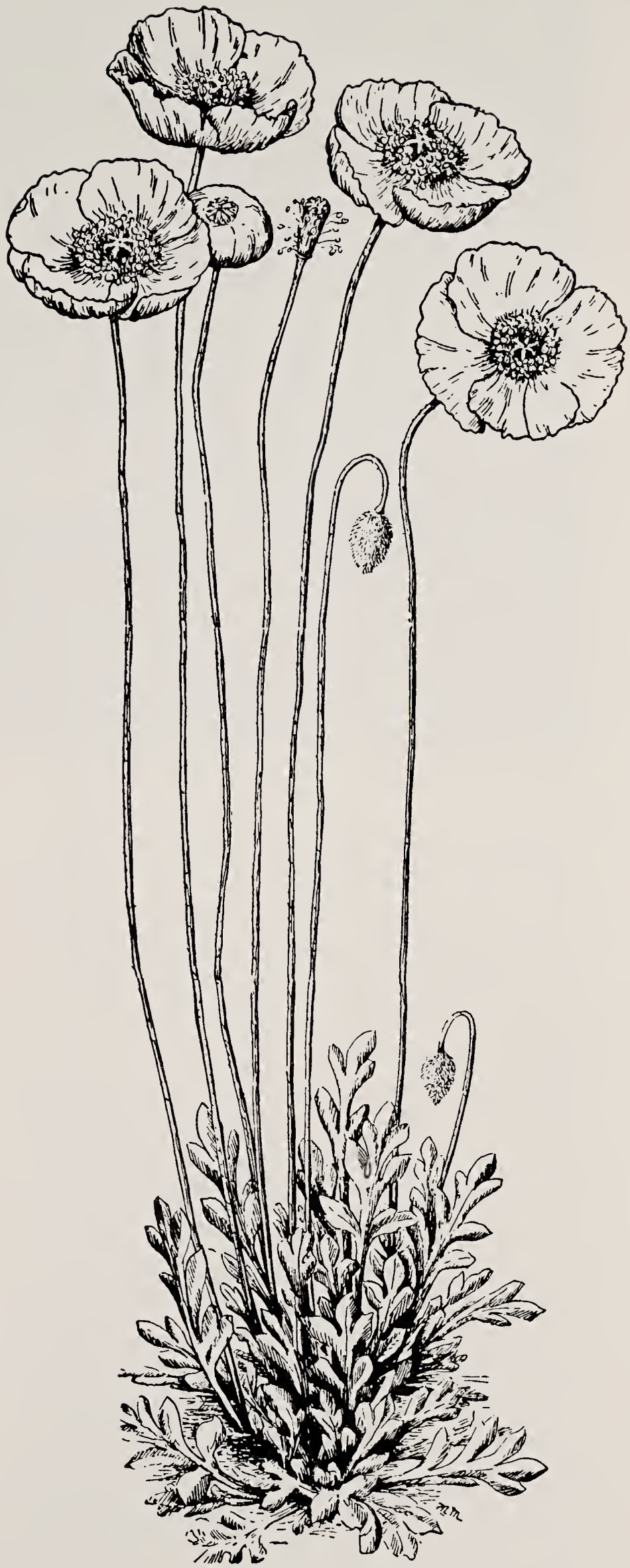
you traveling back many years? A fragrance can take me back to the plumeria, ginger and pikate of my childhood in Hawaii.

Each springtime there is the thrill of discovery. One year it was the first blooming of our private honeysuckle, *Lonicera pileata.* The bees buzzed insistently because of the intoxicating fragrance of the many, tiny, creamy-white flowers on the undersides of its woody branches.

As I stroll about, I think about how effective masses of plants are such as my huge elephant ears *(Petasites japonicus)* loping along the back of a curved border of white violets or blue campanula. I notice as well a sweep of yellow *Doronicum* daisies, tall purple or blue Siberian Iris, *Oxalis,* wild ginger and *Epimedium.* The clusters of Eastern and Western solomon seal, the varying shades of pink rhododendrons and the solid screen of *Choisya* are all welcome groupings.

Some of the views that I linger over most are the rhododendron buds standing upright like candles on an old-fashioned Christmas tree and the Ginkgo tree with new leaves like tiny miniature oriental fans. There is the purity of line and color of the evergreen *Vancouveria planipetala* and a delicacy about the tiny new *Epimedium* leaves with their light and airy flowers. My favorite sight of springtime is the lacelike unfurling of fern fronds. The fragrant deciduous azaleas add a splash of yellowish-orange and the new needles of the Colorado spruce *(Picea pungens)* are an appealing soft light green.

There is a comfortable feeling of order in the progress of plants during the seasons, and thus familiarity. But somehow, I forget the exact order, and therefore each spring I am surprised and delighted with each plant's awakening.



Left: Polyanthus Primrose, Primula polyantha; *right: Iceland poppy,* Papaver nudicale. *From the book* Gardener's Handbook *by L.H. Bailey.*

Madagascar

JOY SPURR

A trip to the few remaining natural areas of Madagascar took me into a realm of nature where a strange combination of flora and fauna have evolved endemically for over a million years. At least 1,000 miles long and covering more than 250,000 square miles, Madagascar is the fourth largest island in the world, surpassed only by Greenland, New Guinea and Borneo.

Madagascar's geological formation is still being studied. The continental drift theory indicates that South America, Africa, Antarctica and Australia were once linked. In 1975 scientists found evidence in the sedimentary layers of rock and its fossil remains that Madagascar was originally attached to Africa in the vicinity of present day Kenya and Tanzania, from there it broke away and drifted east and south.

From its eastern shores which border the Indian Ocean, the narrow coastal plain rises in great scarped steps to the central highlands. These reach 8,655 feet at Mount Ankaratra and then descend to the broad, dry, western plain. The topography results in a great variety of habitats, including mangroves, coral reefs, rain forest (which receive 60 to 120 inches annually), tropical forests, savannas, deciduous woodland, semi-arid bushlands, lakes, rivers and even a small area of dune desert.

Ninety percent of all the plant and animal species in the Malagasay forests are unique. Many of Madagascar's plant families originated in Africa. However six plant families or subfamilies, as well as several genera, occur only in South America and Madagascar. Another six plant families grow nowhere else in the world, including Chelaceae, a group of beautiful flowering trees. Only one of Madagascar's 97 species of ebony grows outside the island and all but two of the 130 palm species are endemic.

The flora and fauna of this island evolved together and as a result they have formed parallel biological communities. Only primitive animals existed on Madagascar when it was separated from the mainland and with no powerful predators present, the ancient forms of life have been able to persist and thrive within the various habitats. Of the 235 reptile species, 225 are endemic including geckos, skinks, chameleons, tortoises and colubrid snakes. The boid snakes and two genera of iguanid lizard are related only to the boas and iguanas of South America. Fortunately venomous snakes never reached Madagascar. Among birds, 36 genera and half of the 238 species are unique to this island. Of the 26 species of bats, 13 are endemic, as well as all

Madagascar's periwinkle. Catharanthus roseus. *photo: Joy Spurr*

of the land mammals (34 genera with about 66 species, including the magnificent lemurs).

The animals have been preserved because there were no people on the island until about 1,500 years ago. The first humans to reach Madagascar sailed their outrigger canoes from Indonesia. They were followed by Africans, Arabs, Dutch, Portugese, British and French who came to trade for spices and slaves. The first settlers followed the tradition of shifting cultivation. They felled and burned clearings in the coastal rainforests, planted beans, root staples and dryland rice for their own subsistence. Then after about two years they would abandon their clearings and make new ones. When the Europeans reached Madagascar, forests became an economic commodity. Trees were cut for lumber and to make charcoal which was exported to Europe. By the time people reached the drier woodlands of the interior, the cutting of trees and clearing by fire was unrestrained. In Malagasy legend, the Great Fire burned without ceasing until the center of Madagascar was burned bare. It may have been one fire, or it may have been a century of devastation summed together in tribal memory. Today wood is still necessary for cooking fires and as a result the remaining unprotected forests have little chance of expanding or even surviving.

Most visitors to Madagascar arrive by air at Antananarivo, the capital city. Travel is mainly by air between Antananarivo and the larger coastal settlements. Road systems are not extensive and those between tribal villages are barely more than dirt trails.

Because our trip was oriented to the natural history of the island, we first visited the botanical garden and zoo for a preview of some of the exciting things we would see in the more primitive sections of the island. The garden is part of the Directorate of Scientific Research that houses students of geography, demography, agricultural genetics and medicinal herbs. The institution was founded by a French scientist, Raymond Decary, whose patronym is found in the Latin names of many Malagasy flora and fauna.

In the valley adjacent to the research laboratory, botanical specimens collected throughout Madagascar grow beside three small lakes. Cages hold chameleons, birds, lemurs and reptiles. In a separate museum building there are lemur skeletons almost as

tall as a man, bird skeletons that are up to 9 feet tall, an immense crocodile skull and a carapace of a tortoise which is four feet in diameter. It is an impressive collection of the natural history of Madagascar, but to learn that much of the truly spectacular wildlife of the Malagasy plateau is extinct leaves one with a feeling of sadness. No one will ever again see the largest bird that ever existed, the elephant bird, nor the eleven species of lemurs that were exterminated as a result of man's hunting and destruction of their habitat.

We were anxious to leave the bones and feathers in the museum and begin our search for the exciting, living remnants of Madagascar's plants and animals. The flight to Nosy Be, at the northern tip of the island, passed over the extensively terraced rice fields which surround Antananarivo. We then passed over miles and miles of a barren upland plateau where broad, muddy rivers have cut deep canyons on their course to the Indian Ocean. We were treated to the sight of the spectacular limestone cliffs of the Ankarana Plateau, bristling with jagged ridges and sharp pinnacles. Beyond the Plateau white sand beaches separate the turquoise-hued coral reefs from ribbons of evergreen forest.

In the vicinity of Nosy Be the land is intensively cultivated for crops that are the basis of Madagascar's economy: sugar cane, coffee, vanilla and the fragrant Ylang Ylang *(Cananga odorata),* the flowers of which are collected for export and used to make perfume. Manioc, bananas and coconuts are grown for food. Materials for making baskets, mats and roof thatch come from the native palms including the raffia palm *(Raphia ruffia.)*

A long hike over tide flats, bordered with thickets of mangrove, and a lengthy ride in a narrow outrigger canoe, brought us to the Lokiobe Nature Reserve. This 2½ square mile area is the only surviving remnant of western evergreen tropical forest. It contains large old specimens of rosewood, black ebony, teak, ramy and tamarind. The Reserve protects the black lemur, lepilemur, Madagascar boa, brick green geckos, turret-eyed chameleons and many other endemic animals. Here we saw our first traveler's palm *(Ravenala madagascariensis),* the emblem of the Malagasy Republic. Our guide slashed the trunk with his machete and clear, sweet water poured from the wounds, proving the plant's reputation of succor for the thirsty traveler. This valuable palm also provides housebuilding material for the native people. Its hard seeds resist fire and sprout easily in forest clearings. It grows throughout the island wherever it finds satisfactory moisture and nutrients to take root. We would cross paths with this interesting fan-shaped plant in all sections of Madagascar.

From Nosy Be we returned to Antananarivo and took another flight that eventually brought us to the Lokaro Peninsula, the southernmost point of the island. Taolanaro (formerly Fort Dauphin), the largest town in this region, borders a broad, deep harbor. It is the major shipping center for southern Madagascar. The narrow coastal plain is backed by granite mountains and is a fairly wet region.

A few miles beyond Taolanaro we explored a coastal bog and soon found ourselves knee-deep in pitcher plants. The Malagasy pitcher plant *(Nepenthes madagascarensis)* has a strange adaptation for obtaining its nutrients. Each leaf begins as an ordinary blade, then, at its tip, coils into a loop and then untwists into a conical death-trap for flies, grasshoppers and moths. Once inside the slippery, red-lined lip and inner cup, the insects cannot get a foothold for retreat and soon end up at the bottom in a goblet of enzymes to be digested as the plant's food. The goblet is the size of a large water glass; some up to seven inches high, with a lid almost two inches in diameter.

Scattered in the bog are small outcroppings of granite boulders, the crevices of which are filled with short fronds of a stiff-leaved fern *(Dicranopteris linearis).* A larger fern with leathery, staghorn-shaped leaves *(Phymatodes scolopendria)* flourishes in the moist, acid soil, alongside the pitcher plants. On higher, better-drained soil, orchids appear in surprising places along with a shrubby *Vaccinium* that display white flowers and green berries. We passed a roadside stand where an enterprising young lady was selling small plants of Baobob *(Pachypodium rorolatum)* that grows on the drier mountain slopes. As we continued inland, the narrow, dirt road passed through small tribal villages. We stopped to admire some of the beautiful carved stone and wooden monuments the tribes dedicate to their

A Kalanchoe Daigremontiana *in red-flowered bloom.* *photo: Joy Spurr*

dead. A replica of one of the carvings, a miniature wooden boat with fishermen, is used on Madagascar's 5,000 bank note. Another fine carving shows a crocodile gripping a man's leg, depicting how the deceased lost his life.

Each farmer has a rice paddy on which he raises his own food and sells the excess commercially. When the rice is ready for planting, the field must be churned to a liquid mud. We happened on one field being trampled by a dozen zebu cattle with as many men and boys prodding them to circle the field — all were equally coated with mud. The men were shouting and laughing and appeared to be having fun.

We left the moist coastal region and entered a drier transition zone of shrubs and wildflowers. Few brides would imagine that their bouquets contain a plant whose "roots" are in Madagascar, but there, on well-drained granite outcroppings, *Stephanotis floribunda* cling in the rock crevices.

The road climbed to the Col of Ranopiso, home of the Madagascar rosy periwinkle *(Catharanthus roseus)* and the three-cornered palm *(Neodypsiis decaryi).* The palm is endemic and has a distribution of only 10 square miles. Even in this tiny reserve set aside for this species, the palms are sparsely scattered. Only one specimen was close enough to the road to observe and photograph.

The Madagascar rosy periwinkle escaped the island as a botanical specimen sent to Paris in 1655. By the 18th century it grew in London's Chelsea Physic Garden and was named by Linnaeus. Today it has traveled almost worldwide and is used for arrangements by florists, as a garden annual in borders and planters in the temperate zone, and as a perennial shrublet in the tropics. In many parts of the world it has escaped from cultivated gardens to colonize hillsides and open woods and line roadsides and trails. I recall having seen masses of the pink-flowering periwinkle growing "wild" in Costa Rica and Brazil.

Rosy periwinkle became a miracle drug of folk medicine in many countries. In 1958 a Canadian doctor found that it arrested blood cancers, particularly leukemia. Today the plant is used in combination with other drugs as one of the major weapons against cancer, however its extracts are only a reprieve, not a cure. This species is cultivated in Madagascar

A giant aloe, Aloe helenae, *in bloom.* *photo: Joy Spurr*

and the roots are dried and exported. Six other species of the same genus still grow in Madagascar, each with its own secrets. One species has five compounds that are not known to occur in any other plant.

Native herbs are popular in Madagascar and are important to the economy. Herb sellers gather their wares in the countryside and bring them to Friday markets in the towns. Strange plants, strange names and strange uses abound: *Phellolychium,* a cure for pimples; *Leptolaena fauciflora* for syphilis; *Lycopodium,* an opiate which gives courage to fighting cocks; *Sanira,* a ringworm preventative; *Indigo* for neuralgia; *Salvia* against evil luck; and *Veronica* as a general tonic. The most famous is *Cerbera tanghin,* the ordeal tree, which at one time was used to poison persons accused of witch craft. Present day use, according to our guide, is only for murder or suicide.

From the top of the Col we had our first glimpse of the spiny forest, one of the world's most unique floras. Stretching westward as far as the eye can see the land is of a coarse, sandy soil that supports *Diderea* bushland, a thick, impenetrable, hostile, spiked, spined, thorny, sometimes poisonous, pattern of gray, white, tan and black. Hot and dry, it receives less than 16 inches of rain annually during the months of December through March. Trees and shrubs grow in varying heights from a tough six-inch shrublet to the 30-foot snake-like spires of *Alluaudia.* Their roots delve deep into the soil to seek coolness, moisture and nutrients.

At the time of our visit (July), many of the plants had no leaves. This is the cool, dry season in the southern hemisphere. Shirt-sleeves are comfortable during the daylight hours but a jacket is needed as soon as the sun sets. In the heat of day the spiny forest plants conserve moisture in their thick bark, tough thorns, swollen stems and succulent leaves. Even seed pods and seeds have thick, hard covers so that the seeds can retain their viability for many seasons, or even years, until conditions are right for sprouting.

Many species of *Euphorbia* consist only of swollen green stems, that exude a white latex when bruised or cut (which is typical of euphorbias in general). The latex of *E. stenoclada* is used to make glass cement and to calk pirogues. The sap of *E. laro* causes blindness

if it gets into your eyes. Other species cause blisters or rashes on the skin. Euphorbias are referred to as sausage trees because their fat, divided stems often look like a chain of little sausages strung together.

The giant aloe *(Aloe helenae)* seems to be nature's way of decorating the drab landscape. Tall spikes of flowers burst in a brilliant red circle, like fireworks, against the blue sky. Among the strangest sights was a small branch of *Barleria* which appeared to be decked with feathery white flowers. Flowers! Actually these turned out to be colonial flattid bugs, flower mimics, just trying to fool their bird predators. The shrub, *Barleria,* has tubular, red flowers later in the season.

The alluaudias belong to an endemic Malagasy family, the Didiereaceae, a group that evolved an amazing variety of unusual growth habits. *Alluaudia procera* has long, sharp thorns that twist in helices around the plant's long spires. The reddish bark of *A. ascendens* is studded with sharp knobs. *A. dumosa* grows thorns on its branches of linked bulges. Many of the alluaudias grow a single trunk with branches almost in the shape of a real tree, but the genus *Alluaudiopsis* grows bouquets of thorn-studded whips. The fleshy leaf lobes of *Alluaudia* are set vertically to avoid as much direct sunlight as possible thereby conserving moisture.

Occasionally the giant trunk of the elephant's-foot tree *(Pachypodium lamerei),* topped with its tuft of green leaves, towers over the other plants. The thick, leathery bark truly looks like an elephant's gray hide and the corky trunk stores a reservoir of moisture. In time of drought the natives fell a tree so their precious zebu cattle can chew the soft inner wood to get water. For this reason large, old specimens of the elphant's-foot tree are becoming rare.

Many thousands of acres of spiny forest have been burned and the land cleared for sisal *(Agave sisalana)* plantations, which is the main economy in this part of Madagascar. Fortunately the present descendants of the de Heaulme family (the 4th generation) who pioneered the sisal industry, have set aside about 240 acres known as the Berenty Nature Reserve. Several thousand additional acres of native habitat are being preserved by this family at Morondava on the west coast and on the east coast near Taolanaro.

An elephant's-foot tree, Pachypodium lamerei.
photo: Joy Spurr

Berenty Nature Reserve is a naturalist's paradise. The bit of untouched riverine forest on the Mandrare River contains a multitude of animals living wild in perfect balance with each other and with the plants that feed and protect them. Each animal confines its activities to specific layers in this mixture of bushland and deciduous forest. Crocodiles laze on the river shores. The radiated tortoise, decimated because its meat is a tasty food for the natives, finds a safe haven on the forest floor.

Birds are abundant. Black kites gather in large flocks to settle in trees for the night and by day they scavenge along the river bank to feed on dead fish. We saw crested couas, sickle-billed vangas, magpie robins, tiny flycatchers and several small sparrow-sized species we could not identify. We watched the wattled sunbird maneuver his long, curved bill to reach the nectar in a trumpet-shaped flower and a Madagascar kestrel perch on the highest landmarks, his sharp eyes looking for a careless gecko. Long-tailed doves hop from branch

A chameleon in the Berenty Nature Reserve. *photo: Joy Spurr*

to branch searching for fruits and seeds. Some of the leafless trees are decorated with dozens of oblong-shaped, grass nests woven by weaver birds. I soon learned not to be surprised by a large, green, turret-eyed chameleon who would state ar me from his perch in a hibiscus shrub beside the door of my sleeping hut.

The endemic fruit bats, with their fox-like faces, have favorite roosting trees and are quite spectacular when a group of 200 or more take to the air on their leathery wings. Tree snakes are long, slender and unbelievably agile tree climbers who feed on bird's eggs and young birds — but they, in turn, become food for hawks and owls.

The most exciting animals to see in the forest are the lemurs. In all of Madagascar there are 20 species, including 40 different forms, many of which are localized in just one small region. They range in size from the mouse-lemur, the smallest of primates, to the large piebald indri. Lemurs are the sophisticates of the primates; neat, clean, graceful, with round, amber eyes and soft, well-groomed fur.

In Berenty the lemurs live free and wild. Some lemurs seem almost tame and permit you to approach them quite closely. This is especially true of the ringtails who are highly social mammals that travel in troupes of 10 to 20. One way of getting their attention is to bring out a banana. Ringtails go bananas over bananas. They climb up your pantlegs and sit on your shoulders to share a banana. They are gentle creatures, and it is hard to remember that they are wild animals.

Many fascinating hours were spent watching the white sifaka lemurs pluck their dinner of leaves and flowers. They support themselves against the tree's trunk or in crotches of the larger branches, sometimes sitting, sometimes standing upright, and reach out with their long arms to carefully select a twig or flowers and bring it to their mouth. The sifaka is the second largest surviving lemur at 3'9" tall. They bounce from the tree to the ground, run in an upright stance, like a small child, to the next tree where they high-jump to the lowest branch or scamper up the tree's trunk. The sifakas are a bit more wary of human intrusion into their teritory than are the ringtails and limit your approach to about 20 feet. Dressed in pure white fur with black and brown head markings, the sifaka is, to me, the most beautiful and graceful of all primates.

Madagascar's economy, under a Marxist-style government since the 1970's, is far from flourishing. Today 20 tribes speak one language and share one fundamental culture even though their ways of life are as different as the city, desert and rainforest. There are over 8 million Malagasy with more than half of the population under 20 years old. Most of the population depends upon agriculture for a source of income, so the increase in population can only bring more pressure on the land and its limited resources.

Because over 80% of the forest has been cut and burned, many endemic species of flora and fauna have already been lost, both by habitat destruction and killing by man. Most of the rest have been crowded into the few remaining virgin forests and will survive only if those habitats are given such protection as they receive in the Berenty Reserve. Among its citizens there are a few people dedicated to saving their heritage, but there is little money to support their efforts.

It was a privileged time in my life to be able to walk among these unique plants and observe the marvelous animals that evolved in an amazing relationship begun a hundred million years ago.

Andansonia digitala, *baobob, from the 1985 edition of* Die Natürlichen Pflanzenfamilien.

A Connoisseur's Guide to the Maples

DANIEL J. HINKLEY

Daniel Hinkley recently received his Master of Science degree from the University of Washington's Center for Urban Horticulture. He is presently employed as horticulturist at the Bloedel Reserve on Bainbridge Island. This article was the basis for an interpretive brochure on the maple collection at Washington Park Arboretum and is available now.

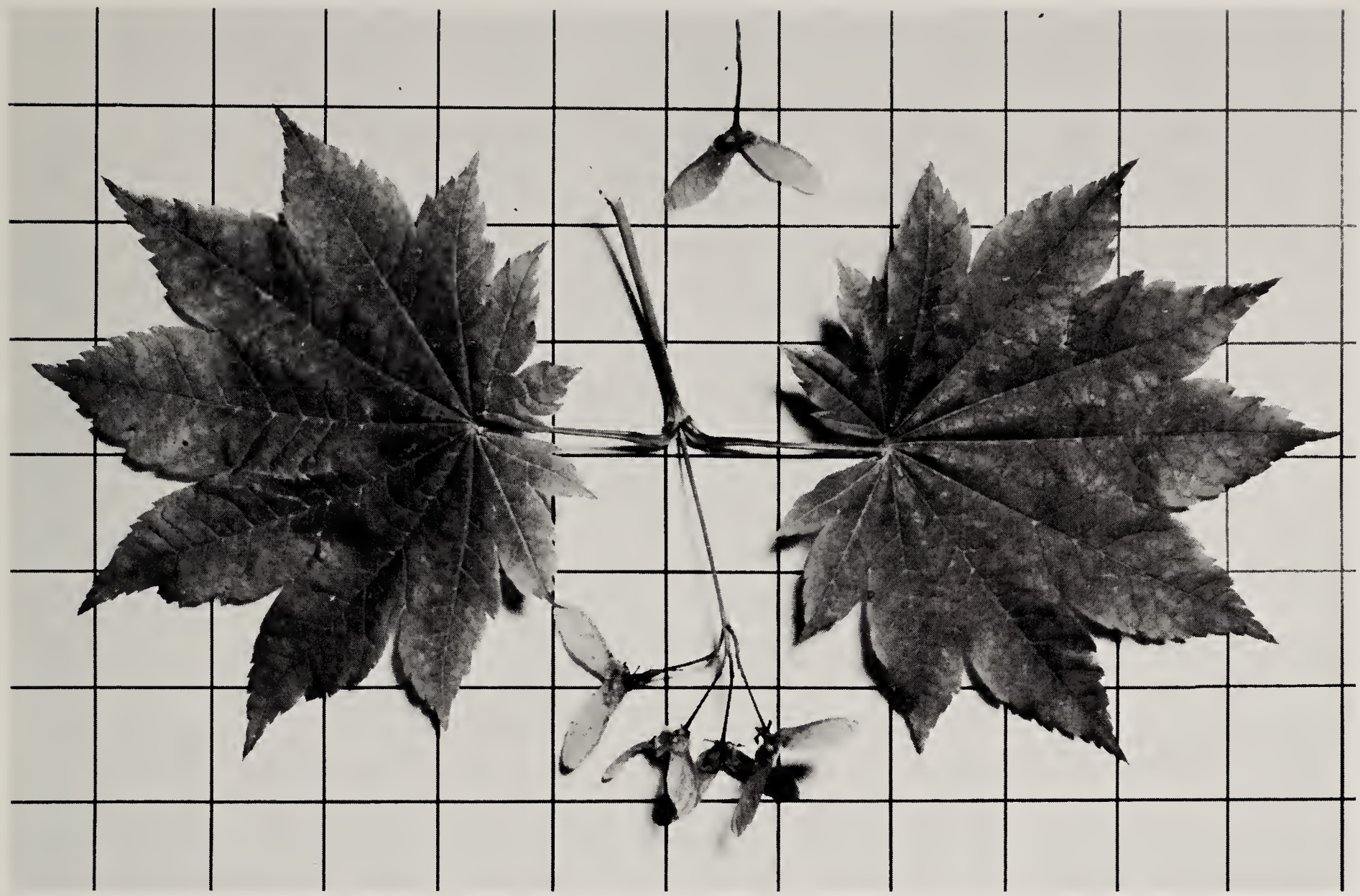
The family Aceraceae contains two genera, *Acer* and *Dipteronia,* both of which are represented in our Arboretum. Comprising over 200 species and innumerable cultivars, *Acer* exhibits extreme diversity yet remains quite distinct taxonomically because of its unique identifying characteristics: opposite branching and winged, paired fruits called samaras. The sexual expression of maples is variable and quite intriguing. While both monoecism (separate male and female flowers on one tree) and dioecism (male and female flowers on individual trees) occur, some species have the ability to function first as a male and then as a female. The genus *Dipteronia,* containing only two species, differs from the maples by having a continuous, rather than one-sided wing around the seed.

With the size of the urban garden site ever decreasing, it is fortunate that many eastern Asian species of maples, as well as some of our native ones, are small in stature yet still exhibit the desirable traits found among their larger cousins: bark texture and coloration, autumn leaf color and ease of cultivation.

Maples can be used in the urban landscape in a variety of ways. Some species can endure the stress imposed on trees as street plantings. Other species enhance the beauty of the lawn or garden while some are more suitable as screens or hedges. They thrive in ordinary soil though each species has different tolerances for soil moisture. Since many of the smaller species included in this article are understory trees in their native habitat, they are quite content in shaded areas as well as in full sun.

The Maple Collection at the Arboretum

The Arboretum already contained an extensive maple collection in its formative years that was expanded by the Director Emeritus



A fruiting twig of Acer japonicum *from the Woodland Garden.* *photo: Whitie Marten*

Brian O. Mulligan and by the late Joseph A. Witt, Curator of Plant Collections. Professor Witt hybridized some of the species found in the collection and his crosses are now mature specimens scattered throughout the Arboretum. Over 135 species, subspecies, cultivars and hybrids of maples are represented in our collection which is one of the best in the United States and perhaps the world.

In addition, there are numerous cultivars of *Acer palmatum* that can be found throughout the Woodland Garden area of the Arboretum. Though I consider *Acer palmatum* a superb choice for the small garden, I have intentionally omitted it from this article because of its already vast popularity and availability.

Seattle's climate is especially well suited to the cultivation of a wide variety of maple species which originate in temperate climates of the world. Even some tender evergreen species thrive, though during the colder winters they will lose their leaves. The relative dryness of the Puget Sound area during the summer months associated with long sunny days enhances the autumn color of both the native maples and those species cultivated in our gardens.

I have selected 20 of my favorite maples in the collection, keeping in consideration traits which would lend themselves well to the urban setting. (Unfortunately many of these species are rarely found in the nursery trade.) The taxonomic maple section to which each of these belongs precedes each maple or group of maples.

Acer section Cissifolia

1. *Acer cissifolium*

From a distance, this maple seems to be East Asia's answer to the North American box elder, *Acer negundo.* Both have trifoliate leaves and downy stems but the similarities end there. Native of the main islands of Japan at elevations of 600-4,000 feet, it grows to a height of 30 feet in a mushroom-like habit. *Acer cissifolium* prefers rather moist conditions. The autumn color is normally brilliant red (although the one in the Arboretum is orange) and has been described as appearing to be a large specimen of the burning bush *(Euonymus alatus).*

Acer section Trifoliata

2. *Acer griseum*

The paperbark maple is a striking, small,

Acer circinatum, *vine maple.* *photo: B.O. Mulligan*

and very hardy tree with unique characteristics which shows interest at all times of the year. In spring, the newly developing trifoliate leaves are red-orange and when fully expanded become green on their upper surfaces and gray-green beneath. In autumn, the foliage passes through orange to deep red. The outstanding feature of this plant is the dark, reddish-orange bark which peels away revealing orange bark beneath. The first introduction from western China was made by Ernest Wilson in 1901 to the Veitch Nursery near London. The largest trees in cultivation are now over 40 feet high. Although this tree has great popular appeal it remains quite uncommon in landscape plantings because it is difficult to propagate.

3. ***Acer mandschuricum***

This species can be either a small tree or large shrub achieving 14 to 22 feet after 25 years. Each leaf is composed of three lance-like leaflets with the terminal leaflet being the longest. The small leaves lend a pleasing focal contrast to landscape plantings. It is a native of eastern Siberia and Manchuria and is closely related to *Acer nikoense.* The autumn color is a rich red to orange.

4. ***Acer nikoense***

Although this species may reach 40-50 feet in its native habitat, it is very slow growing and adapts well to the small garden. The Nikko maple's appearance remains interesting and distinct throughout the year. The leaves are composed of three leaflets on a hairy main stalk; they turn a reliable orange and flame in autumn. Originating in Japan and Central China, this tree is relatively rare in its native lands.

5. ***Acer triflorum***

This rare maple, related to *Acer griseum, A. nikoense* and *A. mandshuricum,* is a slow-growing small tree ideal for the urban setting. The trifoliate leaves unfold in spring covered with a pleasing white down. A native of Manchuria and Korea, individuals mature at 20 to 45 feet, and, from a distance, have a bamboo-like appearance. The bark of *A. triflorum* is a furrowed dark brown. It has been described by Hillier as the most consistent small tree for autumn color — turning shades of orange and crimson in late fall.

Acer section Palmata

6. *Acer circinatum*

The vine maple is one of three Northwest native maples species, the other two being *Acer macrophyllum* (big leaf maple) and *A. glabrum* var. *douglasii* (rock maple). *Acer circinatum* is the only close relative of the Japanese maples, *A. palmatum, A. japonicum,* etc., to grow outside of Asia. Native from British Columbia south to California, its common names comes from the fact that the slender greenish stems are flexible enough to bend to the ground without breaking. It grows in rather sprawling, multistemmed clumps up to 20 feet tall. The flowers of the vine maple have red sepals and white petals which make the flowers the most colorful of all maple species. The foliage is often tinted in summer, and its autumn coloration is a brilliant orange-red. Unfortunately, fall color does not always develop under landscape conditions where stress from dryness or infertile soil may not occur.

7. *Acer japonicum*

The full moon maple is a popular tree, both in the western United States and in its native Japan. It grows from 20 to 30 feet and prefers moist, well-drained soils. The leaves are roundish in appearance and color a deep red in autumn. There are several forms of *Acer japonicum* and all of them make outstanding choices as landscape plants. One cultivar *A. japonicum* 'Aconitifolium' (fern-leaf maple), has deeply dissected leaves, showy flowers in spring and a reliable crimson coloration in autumn.

8. *Acer pseudosieboldianum*

A close relative of the Japanese and vine maples, this species never has fewer than nine lobes per leaf, whereas *Acer japonicum* can have as few as seven. This species forms a very compact tree or large shrub and matures at a height of only 15 feet. Like other species in this group, it prefers moist, well drained soil. *Acer pseudosieboldianum* is native to Manchuria and Korea where it accounts for much of the autumnal beauty in their forests.

Acer section Macrantha (snake or striped-bark maples)

9. *Acer capillipes*

A choice, stripe-bark maple, *Acer capillipes* occurs naturally in a small area on the Japanese island of Honshu. Maturing at 30 to 35 feet, this tree is useful in overstory planting to provide shade for smaller shrubs. The new foliage in spring is a brilliant red and leaf petioles tend to remain so throughout the summer. It is interesting to note that the large, reddish bud scales often remain attached to the branches long after the leaves have unfolded, making the tree appear to be in bloom. Autumn brings attractive tints of orange and red to the leafs.

Stems & branches of a hybrid maple similar to A. grosseri *var.* hersii. *photo: B.O. Mulligan*

10. *Acer davidii*

This maple's young branches are bright green and become striped with white as it matures to a height of about 30 feet. It is the only "striped-bark" with unlobed leaves

which are ovate. They are dark green and color richly in autumn. *Acer davidii* is a native of China and was first described in 1888 by Pere David, an early missionary and plant collector for whom both this species and the genus *Davidia* (dove tree) is named. *Acer davidii* is closely related to *A. grosseri.*

11. *Acer grosseri var. hersii*

This tree has been described by some as the most beautiful of all the stripe-bark maples. In its native habitat of central China, the type *A. grosseri* grows as a small tree from 30 to 40 feet in height. The specimum of *A. grosseri* in the Arboretum is at least 35 feet tall, having been planted there in 1947. *Acer grosseri* var. *hersii* has a more distinct lobing of the leaves and is somewhat hardier. This is one of the last maple species to form autumn color which ranges from a bright yellow to a magnificent red.

12. *Acer pensylvanicum*

The moosewood was for many years the only maple species known for its striped bark. Even now, as many more snake-bark maples have been introduced to the western United States, this eastern North American native remains most distinct and desirable. The bark is beautifully striped with white jagged lines and remains so even after the tree matures at 30 feet. The leaves have a pinkish tinge when they first appear in the spring and turn a soft yellow in autumn. In May, yellow flowers are produced in pendulous clusters.

13. *Acer rufinerve*

This maple has a white and green striping though it may be simply bright green if the specimen is growing in shaded conditions. It is a native of Japan where it inhabits dry locations in mid-to upper elevations. *Acer rufinerve* will grow in moist situations but does not tolerate saturated soils. The young shoots of this species show a bluish-white cast in the spring and the summer foliage is deep green turning to rich crimson and gold in autumn.

14. *Acer tegmentosum*

The last of the striped-bark maples covered in this article, *Acer tegmentosum* is one of the most desirable maple species. The leaves unfold very early in the spring and are a beautiful bright green with a papery texture. The tree matures at about 30 feet and, unlike many stripe-bark species, the bark remains smooth and colorful even on older growth. The leaves turn a bright yellow in early October. A native of Manchuria and Korea, it has always been rare both in the wild and in cultivation. This is partly because it is dioecious and therefore needs to be hand pollinated in order to get seed.

15. *Acer crataegifolium 'Veitchii'*

Within the Arboretum's fine collection of Japanese maples in the Woodland Garden is this outstanding cultivar. Planted in 1966, it is now only 11 feet tall with a spread of 14 feet. Its leaves are handsomely marbled with a rose and white variegation which remains throughout the entire summer. The small leaf size and variable shape of *Acer crataegifolium* offers an attractive contrast in the small urban garden. This species, native of Japan, is suited to moist shaded locations. As with many variegated cultivars, it requires protection from bright sun to prevent leaf scorch. The specific name, *crataegifolium,* denotes the resemblance of the leaves to those of the hawthorn, *Crataegus.*

Acer section Indivisia

16. *Acer carpinifolium*

The hornbeam maple comes as a surprise to those who are expecting typical maple-like leaves. Despite the resemblance in their foliage, *Acer carpinifolium* is easily distinguished from the hornbeam (genus *Carpinus)* because of the opposite leaf arrangement and, in spring, ornamental tassels of green flowers which is typical of maples. The leaves of this hardy maple turn a pleasing gold in autumn. *Acer carpinifolium* becomes a rounded multi-stemmed tree up to 30 feet.

Acer section Rubrum

17. *Acer rubrum*

The red maple is a native of eastern North America where it is often found growing in swampy conditions. The ability of this species to survive in wet sites with low oxygen makes it ideal for planting in compacted soils along city streets. In February and March individuals are covered with small clusters of rich red flowers followed by leaves composed of three triangular lobes. In late summer and autumn the leaves change from a range of bright yellow to brilliant red. There are numerous fine cultivars of *Acer rubrum.*

Acer tegmentosum *photo: courtesy of Washington Park Arboretum*

Acer section Distyla

18. *Acer distylum*

Found naturally on the islands of Japan, *Acer distylum* is the only maple species to possess a leaf which is heart-shaped at the base, very similar to that of a linden. The foliage turns a bright yellow in autumn. Though scarce in cultivation, *Acer distylum* deserves attention as a landscape tree in the urban setting.

Acer section Ginnala

19. *Acer ginnala*

Known as the Amur maple because it is native to the Amur River region of U.S.S.R., *Acer ginnala* can be trained as a small tree or a large shrub. It is the most hardy of the small tree species, quite trouble-free and adapted to most cultural conditions. The flowers appear in May in small yellowish-white panicles and are fragrant. In good cultivars its autumn color is a striking red, though it tends to drop its leaves very soon after they color. *Acer ginnala* should be considered for low maintenance trouble spots in the urban landscape. Because fall color of this species is variable among individual plants, one should choose cultivars selected for having good color.

Acer section Oblongum

20. *Acer oblongum*

This maple species is interesting because of its persistent foliage — under warm climatic conditions the leaves may remain on the tree for more than one growing season. (In extremely cold winters, it will drop its leaves, as did the specimen in the Arboretum during the winter of 1983-84.) *Acer oblongum* is native to the Himalayan mountains and China and was first introduced to England in 1824. It remains a small tree of 20-25 feet in cultivation and is the only maple to have smooth unlobed leaf margins. The foliage does not color in autumn, but the glossy leaves and small stature makes it potentially valuable for the urban landscape.

The Arboretum and the University: The College of Forest Resources

MICHAEL D. POPE

Michael Pope is a graduate student in Environmental Interpretation at the College of Forest Resources.

What a versatile educational resource the University of Washington has in the nearby Washington Park Arboretum. Hugo Winkenwerder, Dean of the College of Forestry from 1912-1945 and the first Acting Director of the Arboretum, envisioned the area which is now the Arboretum as an excellent, close-proximity site for fieldwork and study in forestry and other related sciences. The educational value of an arboretum was quite apparent to Dean Winkenwerder and others who comprehended the progress being made in the biological sciences and forestry.

One of the key objectives suggested for the University of Washington Arboretum was that it serve as an outdoor study area for the various colleges and departments within the University. Indeed, throughout the years, the Arboretum has been used extensively by the students and staff of the College of Forest Resources in the pursuit of their scientific and educational goals.

During the fall of 1985, I was a teaching assistant in a class entitled "Trees in Our Environment" and can attest to the value of the Arboretum as an outdoor teaching facility. Despite the almost continuous drizzle that we experienced during each of our six, three-hour "lab" sessions, both the students and I thoroughly enjoyed the opportunity to systematically study the trees in the Arboretum. As part of our class excursions, we investigated hardwoods from the Southeast United States, discovered evergeen oaks from the Southwest and admired the stately evergreens from the Pacific Northwest.

Students observed and reflected upon important differences in tree silhouettes, crown architecture and branching patterns. These visual observations were enhanced by the chance to use other senses of perception. Their noses were filled with the various aromatic oils present in cedars, firs and members of the laurel family. The opportuni-

Interpretive student, College of Forest Resources, replacing a label on the original Arboretum Waterfront Nature Trail. *photo: M. Pope*

ty to touch an assortment of leaf, branch and bark textures added to the student's comprehension of the uniqueness of individual tree species.

Heightened sensory awareness and increased student appreciation of the finer details of tree anatomy made this opportunity to perceive representative living specimens an integral part of their learning about trees. The educational value of direct first-hand observation can never be sufficiently compensated for by studying even the best herbarium specimens in an indoor laboratory setting. This fact alone makes the Arboretum an incredibly valuable educational resource. The class (myself included) expressed a sense of gratitude and appreciation in being able to study and learn in such a wonderful living laboratory.

"The Arboretum is a priceless resource for teaching dendrology", notes Professor Linda Brubaker, from the College of Forest Resources. Another instructor of dendrology, Professor Reinhard Stettler, has used the Arboretum as a dendrology field laboratory for the past 17 years. Both he and Professor Brubaker point to the Arboretum's near-natural setting as one of its major educational assets. This setting permits insights into the connection of form and function in trees, shows the workings of ecological principles and makes it easy to prepare students for the dendrological variations they will encounter in the field.

Students of dendrology concentrate on recognizing distinguishing tree characteristics and on identifying reproductive features and other special adaptations that will further their understanding of tree form and function. A student in this year's dendrology class summed up the Arboretum's educational value well by stating, "It makes the learning process much more alive and related to our field experience."

The diversity within the Arboretum collection provides the opportunity for students to learn about important species native to the Pacific Northwest and other geographic regions of the United States. In addition, students can study many exotic species as well. Although the Arboretum contains an outstanding representative collection of tree species, the collection demands continual improvement and requires considerable scientific input to ensure the reflection of current

biological thought.

Professors in the College of Forest Resources have found the Arboretum to be a valuable educational resource and have used it for many different instructional purposes. Undergraduate and graduate courses, as well as continuing education classes and research studies are all conducted in the Arboretum. Almost without exception, professors of the College stress the close proximity and convenience of using the Arboretum as its major advantage. Several commented that few colleges and universities have such an excellent, easily accessible outdoor laboratory and, therefore, must either limit or forego any fieldwork, or devote large sums of money and time to transport classes to distant study sites.

From undergraduate classes in the "Introduction to Forest Management" course, through graduate level classes such as "Soil Distribution and Classification", thousands of Forest Resource students have benefitted from their educational experiences in the Arboretum. In years past, the Arboretum has been incorporated into classes about aerial photography and surveying. More recently, Professor Robert Lee has used the Arboretum as an outdoor laboratory for his class, "The Sociology of Leisure".

Foster Island and the marshlands gave students of Professor Grant Sharpe's course "Environmental Interpretation" an opportunity to develop a self-guided nature trail. Subsequently, this and other classes in environmental interpretation studied the use (and abuse) of the trail by Arboretum visitors.

The Arboretum also plays a role in the research activities of some members of the College. A former student conducted graduate research and wrote a master's thesis on the visitors and their use of the Arboretum. Several research methods courses have derived benefits from the area. Skills and techniques in plant research and propagation are practiced and refined. Also, plants in the Arboretum's collections have been used as research material for studies of cold resistance by Professor W. Hatheway and others.

These are but a few of the many educational activities in which students and faculty of the College of Forest Resources have participated while using the Arboretum. The urban setting of Seattle, far removed from the natural stands of trees and diverse forest habitats, adds to the importance of the Washington Park Arboretum as an outdoor instructional facility. Professors throughout the College cherish the Arboretum as a unique educational resource and students truly enjoy the opportunity for nearby field study. As an educational resource, the Arboretum can best be described by simply saying, "It's outstanding!"

Pine cone drawing by Sylvia Chesley Smith.

Timothy Hohn
Curator of Plant Collections

An international search was completed when Mr. Timothy Hohn of New York City accepted the positon of Curator of Plant Collections in the Center for Urban Horticulture. The Curator position is funded partially by donations from the Arboretum Foundation and the Northwest Horticultural Society.

Mr. Hohn is a native of Michigan where he received an undergraduate degree in communications from Western Michigan University. He returned to school to receive a Bachelor of Science degree in horticulture from Michigan State University. In April, 1986, he expects to be awarded the Master of Science degree from the Longwood Program of the University of Delaware.

Mr. Hohn has had a varied career in management of plants. He has worked as a landscape gardener and in a landscape operations company in which he was manager. He spent time as a cooperative extension agent of the University of Georgia. He comes to Seattle from the New York Zoological Society where he was Curator of Plants. In this position, he was responsible for all plantings in and around the Bronx Zoo and was involved as plant manager of the new exhibit named JungleWorld.

Mr. Hohn brings a strength in plant materials and management, communications, and leadership skills. Among his first priorities will be to become more familiar with the landscape flora of the Puget Sound area and to become acquainted with the organizations and people associated with the Center and Arboretum. He will be part of a team along with the Director, landscape architect, horticultural taxonomist, and other curatorial staff of the Center responsible for developing a plant collections policy and then a master plan of plantings and renovation. He will develop the maintenance schedule for plant collections both in the Arboretum and at Union Bay. Mr. Hohn will also play a role in the public outreach activities of the Center in plant identification and education.

Mr. Hohn's wife, Cheri Singer Hohn, is in horticultural therapy. The Hohns will arrive in Seattle in late May.

Dr. Harold B. Tukey, Jr.
Director of Arboreta

Life Members of The Arboretum Foundation

We wish to express our sincere appreciation to the following members who have increased their commitment to the Arboretum Foundation to that of Life Members:

Mr. & Mrs. George Fahnestock
Miss Wilma Wise Nelson

Book Reviews

Wild Plants of the San Juan Islands, by Scott Atkinson and Fred Sharpe. Published by The Mountaineers, Seattle, Washington. 1985. 176 pages with color photographs and line drawings. price $7.95

This book is the only one available that specifically covers the wild plants (mainly wildflowers) of Washington's archipelago in the Strait of Juan de Fuca, the San Juan Islands. Its coverage also includes the southern parts of Canada's Gulf Islands and the southeastern part of Vancouver Island. Written in conversational prose, the book captures the diagnostic features of the most commonly encountered plants and provides a brief statement of where each can be located on the islands. Indeed, the book presents a natural history account of the 192 most common and/or unusual wild plants of the area, of which 189 are illustrated with line drawings.

The main part of the book is organized into seven habitats or areas: meadows, open rocky outcrops, woodlands, maritime, fresh water, disturbed sites and Mt. Constitution. The climate, geology and main aspects of the plant communities in each habitat type or area are discussed and the included plants are organized by color. Although certain species occur in more than one habitat type and may have more than one flower color, the arrangement "works" most of the time. The descriptions include information on location, immediate habitat, notable morphological features and ethnobotanical uses (if any). The authors mention when another species may be confused with a given plant, but generally they do not include sufficient characters that really differentiate the two. (Keys to the species are not included.) However, the reader is alerted if a poisonous species resembles the one under discussion. The descriptions are generally accurate and mostly free of typographical errors. The only significant error discovered is on page 36 where the authors infer that the "Ice Plant" is closely related to the stonecrops (genus *Sedum);* the "Ice Plant" is in the genus *Mesembryanthemum* (family Aizoaceae) and is allied to the pinks, cacti and smartweeds, not to the stonecrops or roses! Although technical terms are generally avoided, the authors include a brief, but clearly phrased glossary for the terms that may not be readily understood.

Low Oregon-grape.

The book concludes with a bibliography, an index to plant names (scientific and common), and an annotated checklist with 829 entries of vascular plants known for San Juan County. In addition, there is a brief discussion of plant distributions with a list of species expected, but not found or rarely encountered, on the islands (but common in other areas of Puget Sound) and a list of species that occur usually east of the Cascade Mountains but also on the islands (generally not elsewhere west of the Cascades).

Wild Plants of the San Juans is highly recommended as an initial introduction to the plants of the San Juan Islands. It is up-to-date, easy to read, accurate and it provides many first-hand observations of the natural history of the plants that grow on the islands.

Melinda F. Denton

Classic Roses, By Peter Beales. Published by Holt, Rinehart, & Winston, 1985. 432 pages, 540 color photographs. price $45.00

Classic Roses is a very finely illustrated encyclopedia and grower's manual of old roses, shrub roses and climbers. This marvelous and comprehensive book is divided into four parts. Part One describes the history and evolution of the rose — one of the world's most ancient cultivated genera. Mr. Beales tells us its earliest cultivation by man probably

began in China more than 5,000 years ago. Wild roses, like the European species *Rosa canina* (the dog rose) are single with 5 petals, as were all of the "original" roses. Mr. Beales writes about the evolution of the rose species as being from the subgenus *Pimpinellifoliae,* this includes roses from Europe, America, Asia and even a yellow form from the Middle East. The Empress Josephine, as well as the marvelous paintings of Redoute, influenced the rise in popularity of the rose, especially in Europe.

Mr. Beales' illustrations are so real that one can almost feel the dew on the petals and smell the fragrance. He describes the race for bigger and better show class blossoms, prompted by the work of a Frenchman, M. Buillot and his tea rose or hybrid perpetual cross. The result was 'La France', a huge sensation in the realm of rosedom, and the beginning of the modern day hybrid tea rose.

Part II covers the use of roses in the landscape, including how to incorporate shrub roses and older varieties into your own garden (wild or woodland). Also discussed is the formal and informal use of roses on walls and fences, and in pots and tubs. There are suggestions for companion plantings and roses to grow for their perfume, ornamental foliage and hips.

Part III discusses all the problems one might ever have with buying, planting, pruning and feeding roses, as well as weed and pest control. Propagation is thoroughly covered with suggestions for grafting, taking cuttings, layering, growing from seed and even tissue culture. A good series of illustrations shows one exactly how to plant and prune a new rose. There is a chapter on "heeling in", for those who buy a plant before they know where it belongs.

The final section, Part IV, which comprises the last two-thirds of the book, is devoted to the four subgenera of *Rosa.* These are then divided into separate groups arranged in accordance with their dominant characteristics and differences. The garden groups of roses, like Albas, Bourbons, Damask, Teas, etc., are arranged under the species where they belong according to their lineage. If one wishes to look up a certain rose in this book and is not sure to which group it belongs, there is a complete alphabetical listing in the index.

This is a lovely, very readable and very useful book for the devotees of old-fashioned roses and, if you are not really a serious student of the genus *Rosa,* the beautiful photographs will delight you and make the book well worth the price.

Lee Clarke

Loretta Slater

Working quietly among us for 24 years was a most remarkable woman, Loretta Slater, our "book lady", a member of Unit 41, and a dedicated humanitarian and environmentalist. Loretta died July 10, 1985 about three months after her husband, Harry Slater's death. They left their property, 100 feet of prime waterfront 300 feet deep, with a house and dock, to the city of Mercer Island to be developed as a park. The remainder of their estate was left to other civic organizations including the Arboretum Foundation. Loretta was an only child and she and her husband had no children.

Because Loretta chose to keep a low profile, we have only glimpses of her many activities as remembered by her friends. Loretta was an active member of the Mountaineers & Mountain Rescue, the Cascade Bicycle Club, the American Youth Hostels, the Mercer Island Garden Club, the Rhododendron Society, the Audubon Society, the Weavers Guild and the Mercer Island Historical Society. She was in the Saddle Club and worked with the 4H Pony Club. In 1961 Loretta joined the Arboretum Foundation as a life member. She was in charge of selling gardening books for 12 years and we can remember her carting boxes of books to all our activities.

Visiting with Loretta's friends uncovered many incredible stories. She left a legacy of environmental and social improvements.

Hazel Fiedler

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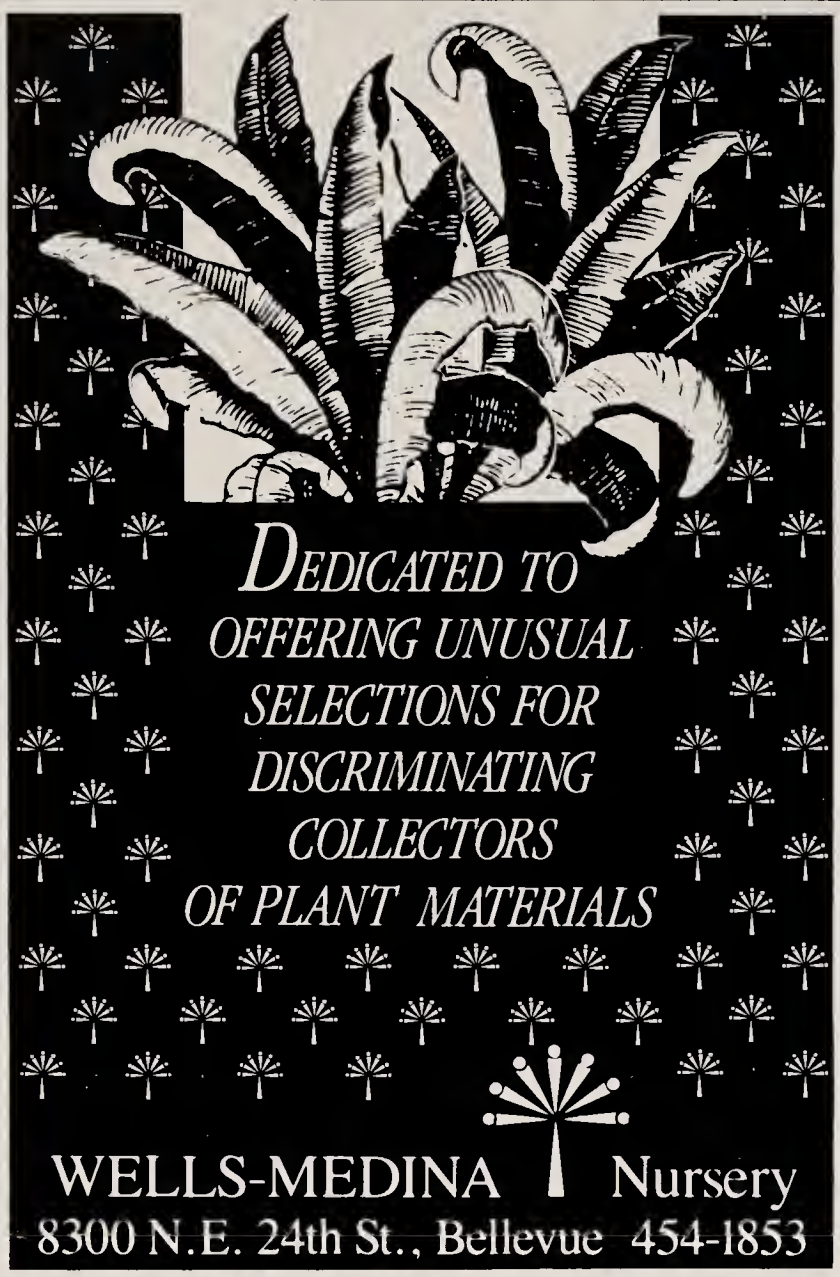
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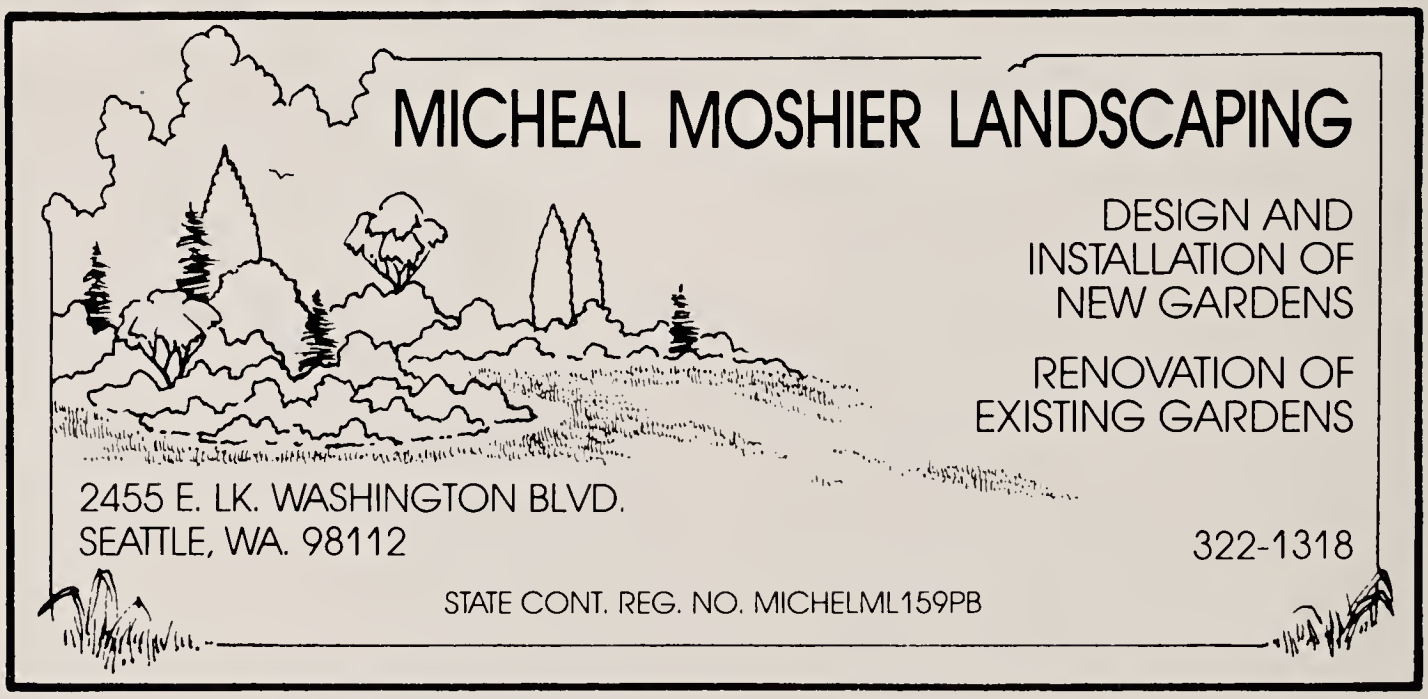
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